GOVT

Department of Foreign Affairs and International Trade

ND ECONOMIC POLICY PAPER

No. 98/01



Ministère des Affaires étrangères et du Commerce international

CANADA

Accounting for Canadian Export Growth 1983 to 1997

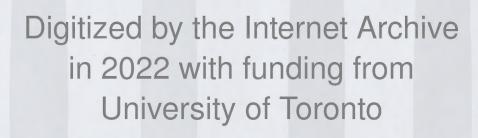
By

Shenjie Chen

and

Prakash Sharma
Trade and Economic Analysis Division (EET)

(December 1998) SP86A



CA 1 EA 11 -1998 TO 1

TRADE AND ECONOMIC POLICY PAPER

No. 98/01



Department of Foreign Affairs and International Trade



Ministère des Affaires étrangères et du Commerce international

CANADA

Accounting for Canadian Export Growth 1983 to 1997

By

Shenjie Chen

and

Prakash Sharma
Trade and Economic Analysis Division (EET)

(December 1998) SP86A



Department of Foreign Affairs and International Trade

TRADE AND ECONOMIC POLICY PAPER

98/01

Accounting for Canadian Export Growth: 1983 to 1997

By

Shenjie Chen

and

Prakash SharmaTrade and Economic Analysis Division (EET)

(December 1998) SP86A

Trade and Economic Policy Commentaries and Studies are intended to foster discussion of international trends and issues by trade and foreign policy officials more generally. The opinions discussed are not necessarily those of the Government of Canada.

Acknowledgements

The authors would like to thank, without implicating, Pierre Duguay (Adviser, Bank of Canada), Chantal Dupasquier (Assistant Chief of the Research Department, Bank of Canada), Claude Lavoie (Economic Studies and Policy Analysis, Finance), Jian-Guo Cao (Economic Analysis and Forecasting, Finance), Patrick Grady (Global Economics Ltd.), Sonia Granzer (ITP, Finance), Roy Roger (Transport Canada) and Anne Francis (URR) who provided valuable comments on many technical issues of this paper. Special thanks to Andy Rylyk (U.S. International Trade Commission, Washington, D.C.) who provided the U.S. customs duty data. We also thank our colleagues in the Trade and Economic Analysis Division for their helpful comments.



Accounting for Canadian Export Growth: 1983-1997

	Executive Summary	iv
	Sommaire	V
1.	Introduction	1
2.	Some factors that contributed to Canadian export growth	2
	2.1 Real GDP growth in partner economies	2
	2.2 The price competitiveness of Canadian products	2
	2.3 Trade liberalization, under such agreements as the FTA, the NAFTA and the	
	WTO/GATT	4
3.	Data, methodology and estimation	4
	3.1 The estimated results for Canadian exports to the U.S.	
	3.2 The estimated results for Canadian exports to the rest of the world (excluding t	he
	U.S.)	. 12
4.	Conclusions	. 14
	Bibliography	. 16

Accounting for Canadian Export Growth: 1983-1997

1. Introduction

It is a well-known observation that starting in 1990-91 Canada's export performance has been stellar. Between 1990 and 1997, while real (inflation-adjusted) domestic demand increased at an annual rate of 3.1%, total Canadian real exports of goods and services accelerated at an annual rate of 6%¹. Export growth led Canada's economic recovery in the early 1990s and continues to make a significant contribution to economic and employment growth in Canada. This dimension of changing Canadian economic performance is highlighted by an increase in the ratio of total exports of goods and services to GDP by more than fourteen percentage points, from 25.5% in 1983 to 40.2% in 1997.

This report measures the impact on the performance of Canadian exports of changes in major factors such as the real (inflation-adjusted) Canadian dollar exchange rate, foreign GDP growth and trade liberalization for the period 1983 to 1997.

During this period, Canadian businesses and workers improved their export performance against the following backdrop:

- From 1983 to 1990, the Canadian real exchange rate with the U.S. dollar appreciated by 8.5%, from US\$ 79 cents in 1983² to US\$ 85.7 cents in 1990; during the period from 1991 to 1997, the real exchange rate depreciated by 22.8%, from US\$ 87.9 cents in 1991 to US\$ 67.9 cents in 1997;
- The Canada-U.S. Free Trade Agreement (FTA) came into effect in 1989, the North American Free Trade Agreement (NAFTA) in 1994 and the Uruguay Round on January 1, 1995;
- The U.S., Canada's dominant trading partner, has posted impressive real GDP growth since 1992.

There has been an intense debate among policy-makers and economists on the relative importance of the factors that have contributed to the observed growth in Canadian exports. The issue comes down to the following: Is the effect of a one percent lower Canadian dollar on Canadian exports greater or less than a one

Data used in this paper are from Statistics Canada, unless indicated otherwise. Real data are inflationadjusted.

The exchange rates are inflation-adjusted average annual values for the year indicated, thus they are not nominal rates which are more familiar and which are reported routinely in the press.

percent increase in real GDP in the U.S.? What has been the impact of the Canada-U.S. FTA on Canadian exports? Many commentators, particularly in the popular press, have argued that the growth in Canadian exports to the U.S. market has largely been driven by the weak Canadian dollar³.

The paper is set out as follows: Section Two reviews the main factors that have contributed to Canadian export growth. Section Three presents results of econometric estimation. Section Four concludes the paper by summarizing the main findings in the context of a policy discussion.

2. Some factors that contributed to Canadian export growth

Three main factors appear to have contributed to the growth of Canadian exports between 1983 and 1997:

- Real GDP growth in our major trading partners;
- The price competitiveness of Canadian goods and services;
- Trade liberalization under such regional agreements as the FTA, NAFTA, and multilateral agreements under the WTO/GATT.

2.1 Real GDP growth in partner economies

Real GDP growth in our major trading partners encourages consumption and investment spending on Canadian goods and services. For instance, as a rule of thumb, a change in U.S. GDP begins to impact on the Canadian economy after one quarter, via changes in our exports to the U.S. market. GDP developments in Canada's other trading partners take a bit longer to affect Canadian exports.

2.2 The price competitiveness of Canadian products

The price competitiveness of Canadian goods and services in the international market would increase following a real (relative inflation rateadjusted) exchange rate depreciation of the Canadian dollar⁴. To assess the consequences of a change in price competitiveness, we need to take into account not only the change in the nominal exchange rate, but also the change in prices in Canada relative to price changes abroad⁵.

³ The Financial Post, "Canada seen losing ground to U.S. in Asia", Sept. 4, 1997.

⁴ The price competitiveness of Canadian products can be measured by the real exchange rate between the Canadian dollar and the currencies of Canada's trading partners. The real exchange rate is defined as the *nominal* exchange rate multiplied by the ratio of the Canadian price index and the price index abroad (U.S.).

Suppose that the nominal Canada-U.S. dollar exchange rate were 75 U.S. cents, and that the Canadian price index increases from 100 to 110, while the U.S. price index remains at 100. In this case, the real

Suppose that the *nominal exchange rate* of the Canadian and the U.S. dollar depreciates by 20% (i.e., the Canadian dollar is worth 20% less at any given time), making Canadian products less expensive in the U.S. Further, assume that the prices of U.S. products decrease by 20% at the same time, while the Canadian price level remains unchanged. In this case, lower prices of Canadian products in the U.S. are exactly offset by lower U.S. product prices such that the *real exchange rate* between the Canadian and the U.S. dollars would remain unchanged. Consequently, one would not expect any change in the relative price competitiveness of Canadian products in the U.S.

Does a nominal depreciation of the Canadian dollar *necessarily* result in an improvement in price competitiveness of Canadian products abroad and hence higher export sales? Yes and No.

- Yes, if Canadian and foreign inflation rates are the same.
- No, if higher Canadian inflation than that abroad wipes out the nominal depreciation of the Canadian dollar.
- Yes, if the inflation rate in trading partners is higher than in Canada.

How do real exchange rate changes affect Canadian exports? In theory, a real depreciation of the Canadian dollar can be expected to increase the price competitiveness of Canadian products in foreign markets. Conversely, a real appreciation of the Canadian dollar would erode the price competitiveness of Canadian products.

What would make the product price increases (inflation) smaller in Canada than those in our competitor economies? Consider the following factors:

- Stable macroeconomic policies: If Canadian authorities conduct prudent fiscal and monetary policies that generate a stable economic environment, such as a lower and stable inflation rate than in our trading partners, favorable price developments in Canada and the short-run real exchange rate advantage would boost international price competitiveness of Canadian products.
- *Higher productivity growth:* Higher labour and capital productivity growth would reduce the unit costs of Canadian products and exert a downward pressure on prices and inflation in Canada. In plain language, higher productivity growth makes Canadian exports more price competitive.

exchange rate between Canada and the U.S. dollar would appreciate from 75 cents to 82.5 cents, although the nominal exchange rate remained unchanged at 75 cents.

2.3 Trade liberalization, under such agreements as the FTA, the NAFTA and the WTO/GATT

Starting in the late 1980s, Canadian exports had better market access to foreign markets on account of free trade agreements such as the FTA and NAFTA, particularly to the U.S. Furthermore, in implementing the Uruguay Round in recent years, Canada and most of its trading partners have successively lowered or removed many trade barriers. Trade liberalization resulting from these bilateral and multilateral agreements has contributed to the growth of Canadian exports.

While some policy analysts expected to see a particularly large impact of the Canada-U.S. FTA on Canada's trade with the U.S., others had anticipated the impact to be of a small quantitative magnitude⁶ on the grounds that the tariff rates between Canada and the U.S. were low before the FTA. In this view, the FTA was not expected to have a significant impact on Canadian exports as compared with the impact of other economic policies and external economic developments. We report our results on this and other matters below.

3. Data, methodology and estimation

We have used a dynamic non-linear regression model to estimate two relationships as specified by the following equations:⁸

- Canadian real exports to the U.S. are a function of: (a) real GDP in the U.S.;
 (b) the real exchange rate between the Canadian and U.S. dollars; (c) a policy variable representing the effect of the Canada-U.S. free trade agreement; and
 (d) a constant that picks up other effects not explained by the previous three variables.
- 2. Canadian real exports to the rest of world (excluding the U.S.)⁹ are a function of: (a) the real world GDP; (b) the real Canadian exchange rate; (c) a policy variable representing the effect of the multilateral trade liberalization; and (d) a

⁶ Cox, D., and Harris R. "Trade liberalization and Industrial Organization: Some Estimates for Canada." Journal of Political Economy, February 1985.

⁷ For instance, the average U.S. tariff on imports from Canada was 3.3 percent, and the average Canadian tariff on imports from the U.S. was 9.2 percent. Source: Smith, Murray G. "The Economic Impact of the Canada-U.S. Free Trade Agreement and NAFTA", The Centre of Trade Policy and Law, Carleton University and the University of Ottawa, mimeographed, 1995.

⁸ For a discussion of the dynamic non-linear estimation, see Alain Paquet, "A Guide to Applied Modern Macroeconometrics", Working Paper No. 94-05, Ottawa: Department of Finance, Economic and Fiscal Policy Branch, 1994.

⁹ Due to data limitations in many less developed countries, Canada's major trading partners excluding the U.S. included in this study are Japan, U.K., Germany, South Korea, France, Netherlands, Italy, Mexico, Austria, Norway, Spain, Hong Kong, Singapore, Switzerland, Philippines, South Africa and Israel.

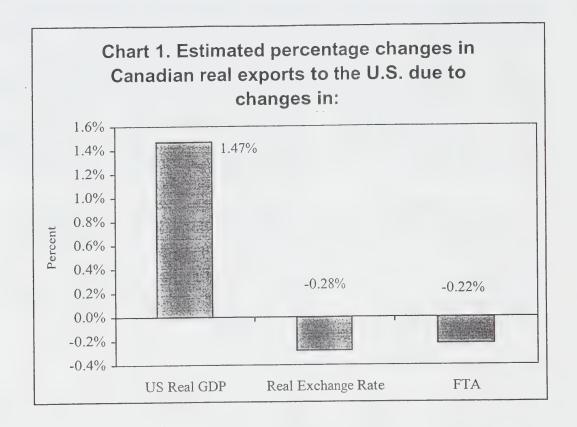


Table 1. The estimated effect on Canadian exports to the U.S. of changes in real GDP, real exchange rate and the FTA in the long run, 1983-97							
1% change in the variable:	causes an estimated percentage change in	standard error of	t-statistic: statistically				
variable.	Canadian real exports to	the	significant if				
	the U.S. of:	estimate	> 1.67				
Constant term	-2.51	2.10	-1.20				
Real US GDP	1.47	0.24	6.05				
Canada-U.S. FTA	-0.22	0.04	-6.08				
Real exchange rate	-0.28	0.13	-2.68				

Sample size = 60

Percentage change in Canadian exports to the U.S. explained by the above variables (Adjusted R-

Squared) = 82%

Durbin-Watson test = 1.86

constant that picks up other effects not explained by the previous three variables.

Some proxy variables. In the equation for Canada's exports to the world, the real effective exchange rate ¹⁰ was used as a proxy of the real Canadian exchange rate between Canada and its major trading partners. The real GDP for the world was constructed as the total GDP of Canada's major trading partners (expressed in 1990 prices) and was weighted by the share of Canadian exports to these countries. In the equation for Canadian exports to the U.S., the FTA impact variable was calculated as the proportion of the customs duties on imports from Canada in the total value of U.S. imports from Canada. The decline in this variable would represent the FTA-induced reduction/elimination of U.S. tariffs on imports from Canada. For instance, between 1983 and 1988, the U.S. import duty bill on Canadian products averaged 1% of the total U.S. imports from Canada. However, the corresponding figure started declining in 1989 and by 1997 had fallen dramatically to 0.15%.

Data transformation. To remove the effect of inflation, we expressed exports in 1992 prices by dividing the export data by the Canadian export price index. The nominal exchange rate between the Canadian and the U.S. dollar was converted into the real exchange rate by multiplying the nominal exchange rate with the Canadian Consumer Price Index (CPI), then divided by the U.S. CPI. 11

3.1 The estimated results for Canadian exports to the U.S.

We used econometric estimations to check for a stable (steady-state) long-run relationship between Canadian exports to the U.S. and policy variables such as the real exchange rate, U.S. GDP and the U.S. tariffs on imports from Canada. The co-integration test turned up support for such a long run relationship. 12

Chart 1 presents long run results for Canadian exports to the U.S. As shown in Table 1, the estimated results for the real exchange rate, real U.S. GDP and

Given that the share of Canada's trading partners in total Canadian exports is not equal, their exchange rates are also not equally important. A scheme, called the nominal effective exchange rate, measures the exchange rate between Canada and Canada's trading partners by attaching to each exchange rate a weight of actual exports with the partner country. The nominal effective exchange rate is then converted into a real effective exchange rate as discussed above. In this report, the weighted real effective exchange rate was calculated based on the U.S. dollar, Japanese Yen, German Mark, French Franc and Dutch Guilder.

Data sources: Data used in this report are quarterly, seasonally adjusted, spanning the entire period between 1983 and 1997. All variables are in logarithms. Data for the nominal exchange rate between Canada and the trading partners, Consumer Price index (CPI) and real GDP for Canada's partner countries were taken from the IMF's International Financial Database. U.S custom duty data are taken from U.S. Dept. of Commerce.

¹² Co-integration results are available from authors upon request.

FTA impact were statistically significant, as the above discussion in Section 2 would have led us to expect. The following are the major findings of the estimation:

- A one-percent real depreciation of the Canadian dollar increased Canadian exports to the U.S. by 0.28 percent.
- A one-percent increase in the U.S. real GDP increased Canadian exports to the U.S. by 1.47 percent.
- The Canada-U.S. FTA induced one-percent decrease in the U.S. duty ratio increased Canadian exports to the U.S. by 0.22 percent.

Table 2 presents the estimated short-run results for Canadian exports to the U.S. The short-run deviations in Canadian exports emerge as the initial policy/parametric change and eventually reach the long-run relationship as described in Table 1. The following are the major findings for the estimated short-run developments in Canada's exports to the U.S.:

- The short-run impact of an exchange rate change on Canadian exports to the U.S. was much stronger than the long run impact as reported in Table 1.
 - A one-percent real depreciation of the Canadian dollar increased Canadian exports to the U.S. by 0.97 percent, compared to only 0.28 percent in the long run.
- The short-run impact of the exchange rate change on Canadian exports to the U.S. lasted more than two years (nine quarters). This result is consistent with conventional wisdom that trade flows respond rather slowly to exchange rate changes.
 - Our findings support the explanation that factors such as the persistence of consumption habits, overlapping foreign exchange contracts, and the established long-term supplier-customer relationships could account for short-run rigidities in trade flows.
- A one-percent increase in the U.S. real GDP increased Canadian exports to the U.S. by 2.23 percent in the short-run.
 - However, the growth of the U.S. economy did not translate into the growth of Canadian exports to the U.S. right away; it was delayed by one quarter. This is a well-known observation in the empirical literature and lends support to the validity of the model estimated in this report.

Table 2. The estimated effect on Canadian exports to the U.S. of changes in							
real GDP, real exchange rate and the FTA in the short-run, 1983-97							
1% change in the variable:	causes an estimated	Standard	t-statistic:				
	percentage change in	error of	statistically				
·	Canadian real exports to the	the	significant if				
	U.S. of:	estimate	> 1.67				
Previous quarter exports	0.37	0.09	3.81				
Real US GDP, effects	2.23	0.88	2.54				
delayed by one-quarter							
Canada-U.S. FTA, effects	-0.02	0.06	-0.40				
delayed by three-quarters							
Accumulative impact of	-0.97	n.a.	n.a.				
real exchange rate							
changes, effects delayed							
by up to nine-quarters							
Adjustment between long-	-0.83	0.15	-5.58				
run and short-run							

- The short-run impact of a tariff reduction on Canadian exports to the U.S. is insignificant as evidenced by a small coefficient for the FTA variable and corresponding low t-statistics indicated in Table 2.
 - A one-percent decrease of the U.S. custom duty-import ratio increased Canadian exports to the U.S. by only 0.02 percent. This implies that reduction or elimination of U.S. tariffs for imports from Canada would not stimulate Canadian exports to the U.S. right away.
 - In order to take advantage of lower U.S. import tariffs under the FTA, Canadian exporters needed to make substantial structural adjustments, establishing new supplier-customer relationships and developing new strategic alliances. All these adjustments take time.
- Table 2 also reports the speed of adjustment in the short run, where Canadian exporters, through their transactions, correct the overshooting or undershooting from the long-run (steady-state) relationship between exports sales and explanatory variables.
 - The estimated coefficient for the speed of adjustment is -0.83. This means that the short-run overshooting and undershooting is corrected by 0.83 percent within a quarter—a relatively quick adjustment response.

Table 3. Factors explaining the changes of Canadian exports of goods and services to the U.S., 1988 to 1997			
Level in 1988	\$115.73 billion		
Level in 1997	\$232.11 billion		
Change from 1988-97	\$116.38 billion		
Change due to:			
FTA	33%		
U.S. GDP growth	20%		
Exchange rate	5%		
Total explained	58%		
Change remaining unexplained	42%		

A discussion of the estimation results for Canadian exports to the U.S.

Between 1988 and 1997, Canadian exports of goods and services to the U.S. was more than doubled. Based on the long-run estimated results in Table 1, we present in Table 3 the contribution made between 1988 and 1997 by each explanatory variable. In the growth of Canadian exports to the U.S.:

- The contribution of the reduction in U.S. tariff barriers to Canadian exports to the U.S. was 33.03%;
- The contribution in the growth of U.S. GDP was 20.1%; and
- The contribution of the depreciation of the real exchange rate was 5%.

Altogether, the estimated equation explained about 58% of variation in Canadian exports to the U.S, while the remaining 42% was unexplained or was not captured by the variables in the model.

The impact of the FTA: A paradigm-shift in Canadian exports. Table 3 provides strong econometric evidence that the effect of the Canada-U.S. FTA helps explain a significant 33.03% amount of the growth in Canadian exports to the U.S. To highlight this finding, we present a graph of Canadian exports of goods

and services to the U.S. in Chart 2. In the pre-FTA period of 1983 to 1990, the annual growth in real Canadian exports to the U.S. was 6.9%. Between 1991 and 1997—the post-FTA period—the annual growth rate in Canadian exports to the U.S. accelerated by almost two percentage point to 9.8%. Clearly, such an increase alone in Canadian exports to the U.S. cannot be explained by the growth in U.S. GDP. The average annual growth rate of U.S. GDP between 1983 and 1990 was 3.6%, which was significantly higher than the growth rate of 2.8% in the post-FTA period between 1992 and 1997. Thus, despite being the most important factor in driving Canadian exports to the U.S.:

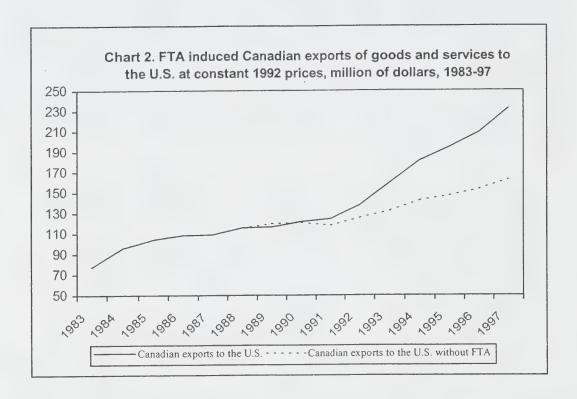
- The growth in U.S. GDP cannot alone provide a convincing explanation of why there was *a fundamental upward change on the trend of Canadian exports* to the U.S. starting in 1990-91.
- The positive and trade-oriented environment created by the tariff reductions and the other provisions of the Canada-U.S. FTA are the most likely explanations for *this fundamental upward change in Canadian exports* to the U.S. starting in 1990-91.

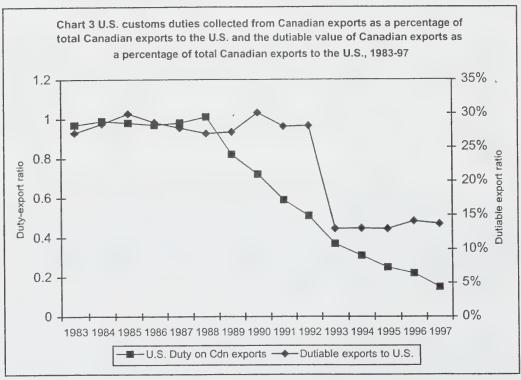
One way to assess the impact of the FTA is to compare the portion of imports that were dutiable in total U.S. goods imported from Canada. Another way is to look at the ratio of the duty paid to U.S. customs in total Canadian exports to the U.S.. The graphs of these two pieces of information are presented in Chart 3. Between 1989 and 1997, the chart conveys the following message:

- Due to the FTA, the portion of imports that were dutiable in total U.S. imports from Canada declined sharply from around 30% before FTA to 13.7% in 1997; and
- Due to the FTA, the ratio of the duty paid to U.S. customs in total Canadian exports to the U.S. also declined dramatically from 1% in 1990 to 0.15% in 1997.

The dramatic reduction or elimination of U.S. tariffs for Canadian exports to the U.S. under the FTA provides an important explanation for the "structural upward-break" of Canadian exports to the U.S. during 1990-1991. It helps to explain why the FTA contributed to 33% growth of Canadian exports to the U.S. in our estimation. The contribution of the FTA to growth of Canadian exports to the U.S. is made through the following ways:

¹³ Source: World Economic Outlook, DRI McGraw-Hill, 1997.





Sources of data: U.S. Dept. of Commerce

- It reduces the costs of Canadian exports to the U.S.;
- It secures for Canadian business fairer access to the world's richest market on the basis of rules and of a rule-based trade dispute settlement mechanism;
- It changes the attitude of Canadians doing business by encouraging them to view North America as an integrated market in their business decision-making.

The impact of the exchange rate. Conventional belief holds that a weak Canadian dollar has accounted for much of the recent surge in Canadian exports to the U.S. The evidence presented in Table 3, however, lends only partial support to this view. The estimation results suggest that the strong growth of U.S. real GDP and the reduction of U.S. tariffs have played a much more important role in determining Canadian export growth to the U.S. than the real depreciation of the Canadian dollar at least from 1983 to 1997. One possible explanation for the weaker role of the exchange rate is that many Canadian products, even though marketed in Canada as well as in the U.S., are actually priced in U.S. dollars, due to a large proportion of south-bound shipments. According to Statistics Canada, sectors such as motor vehicles, pulp, paper and wood products have a significant proportion of products priced originally in U.S. dollars 14. Because the products have already been priced in U.S. dollars, the change in the exchange rate between Canada and the U.S. has little statistically significant impact on the prices of these Canadian products. However, the depreciated Canadian dollar does contribute to the profit margin of those Canadian firms pricing in U.S. dollars.

3.2 The estimated results for Canadian exports to the rest of the world (excluding the U.S.)

Chart 4 presents the estimated results for Canadian exports of goods and services to the rest of the world (defined, in this paper, as excluding the U.S.). Since reliable world tariff data were not available to reflect the progress of worldwide trade liberalization, we have used real world trade volume as a proxy of worldwide trade liberalization. The idea is that trade liberalization would show up as an increase in the world trade. Our results show that:

- A one-percent depreciation of the real effective exchange rate will increase Canadian exports to the non-U.S. world by 0.11 percent.
- A one-percent increase in the world GDP will increase Canadian exports to the non-U.S. world by 0.23 percent.

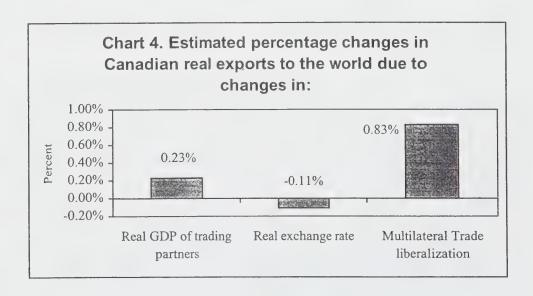
¹⁴ Statistics Canada, *Industry Price Indexes, September 1997*, Cat. no. 62-011-XPB, p. ix.

The impact of global trade liberalization, as captured by our proxy variable, the growth of world trade, is important in explaining the growth of Canadian exports to the world.

• A one-percent increase in the volume of world trade will increase Canadian exports to the non-U.S. world by .87 percent.

However, compared with the export equation for the U.S., the estimated results for Canadian exports to the world are fraught with the following drawbacks:

- The world trade volume variable could have grown, in addition to trade liberalization, due to the increase in intra-industry trade as a result of globalization and economies of scale. If the increase in intra-industry trade resulted from economic scale, it would overstate the benefits of tariff reduction on the change in Canadian exports to the world.
- Business cycles across countries are not necessarily synchronous. For example, the timing of the business cycle in North America, Europe and Asia differed in the 1990s. Aggregating the GDP of such a group of countries into world GDP could even out the variations in the growth of world GDP and would underestimate the power of world GDP in explaining Canadian exports to the world. This accounts, in part, for the small coefficient value reported above for the effect of the world GDP on Canadian exports¹⁵.



¹⁵ In addition, a large constant term in the world equation implies that many factors have not been included or captured by the estimated equation.

	Sable 4. The estimated effect of Canadian exports to the world of change in real GDP accome, the real exchange rate and tariff reduction, 1983-1996					
1% change in the variable:	causes an estimated percentage change in Canadian real exports to the U.S. of:	Standard error of the estimates	T-statistic: statistically significant if > 1.67			
Constant term	-5.69	2.07	-2.74			
Changes in the real effective exchange rate	-0.11	0.16	-0.68			
Multilateral Trade Agreement (WTO)	0.83	0.13	6.21			
Real GDP of G-7 partners	0.23	0.17	1.36			

Sample size = 56

Percentage change in Canadian exports to the world explained by the above variables (Adjusted R-Squared) = 96%

Durbin-Watson test = 2.34

Our results provide strong empirical evidence that the growth of Canadian exports to the non-U.S. world are positively affected by the increase in world GDP, real depreciation of Canadian exchange rate, and trade liberalization. Our model can be further improved by finding the data that would better capture the effects of trade liberalization and the growth of global GDP.

4. Conclusions

This report has used dynamic non-linear econometric methods to obtain quantitative estimates of the main determinants of Canada's exports from 1983 to 1997. We estimated the response of Canadian exports to changes in key economic variables such as growth of real income in foreign countries, changes in the real exchange rate, and the effect of the Free Trade Agreement and the Uruguay Round.

The following are the main findings of this paper:

• Economic growth in Canada's major trading partner, the U.S., was the most important factor contributing to the extraordinary performance of Canadian exports from 1983-1997.

- Trade liberalization has had a strong and positive impact on the growth of Canadian exports of goods and services.
- A nominal depreciation of the Canadian dollar against currencies of Canada's main trading partners did not necessarily result in improved price competitiveness of Canadian products in international markets.
- Both the nominal exchange rate and the price changes (relative inflation rates), i.e., the real exchange rate, have an impact on Canada's price competitiveness.
- To boost the price competitiveness of Canadian products abroad, the following are most helpful:
 - Prudent fiscal and monetary policy: A relatively stable macroeconomic environment, characterized by a lower domestic inflation rate than that abroad, would lead to a strengthening of the real exchange rate of the Canadian dollar and would benefit Canadian exports.
 - An increase in productivity would reduce Canada's unit labour costs and improve cost efficiency, and would also put downward pressure on the general price level in Canada.
- Low inflation as well as productivity growth in Canada would enhance the competitiveness of Canadian exports without recourse to depreciating the Canadian dollar. Together with strong economic growth abroad, particularly in the U.S., Canada would enjoy a continued strong export performance, thereby providing one important element of future Canada's economic growth.
- This outcome supports the view that Canada's economic (export) performance is very much shaped by the world trading system and by the U.S in particular.

Bibliography

Cox, D., and Harris R. "Trade liberalization and Industrial Organization: Some Estimates for Canada." *Journal of Political Economy*, February 1985.

International Monetary Fund, "International Financial Statistics", CD-ROM, 1997.

Paquet, Alain "A Guide to Applied Modern Macroeconometrics", Working Paper No. 94-05, Ottawa: Department of Finance, Economic and Fiscal Policy Branch, 1994.

Smith, Murray G. "The Economic Impact of the Canada-U.S. Free Trade Agreement and NAFTA", The Centre of Trade Policy and Law, Carleton University and the University of Ottawa, mimeographed, 1995.

Statistics Canada, CANSAM database, CD-ROM, 1997.

Statistics Canada, *Industry Price Indexes, September 1997*, Cat. no. 62-011-XPB, p. ix.

Statistics Canada, *National Income and Expenditure Accounts, Fourth Quarter 1997*, Cat. no. 13-001-PPB.

World Economic Outlook, DRI McGraw-Hill, 1997.

